SYNOPSIS

GEOMORPHIC CHARACTERISTICS OF REGOLITH AND ITS IMPACT ON REGIONAL DEVELOPMENT: A CASE STUDY OF DUBRAJPUR BLOCK, BIRBHUM DISTRICT, WEST BENGAL

Name of Researcher – Somnath Sarkar

Name of Supervisor – Prof. (Dr.) V. C. Jha

Department Of Geography

Visva-Bharati, Santiniketan

22/7/2018

अध्यापक / Professor
भूगोल विभाग / Department of Geography
विश्वभारती / Visva-Bharati
शान्तिनिकेतन-७३१२३५ / Santiniketan-731235

GEOMORPHIC CHARACTERISTICS OF REGOLITH AND ITS IMPACT ON REGIONAL DEVELOPMENT : A CASE STUDY OF DUBRAJPUR BLOCK, BIRBHUM DISTRICT, WEST BENGAL

Name of the Researcher: Somnath Sarkar

Name of the Supervisor: *Prof. (Dr.) V. C. Jha .*

Dept of Geography, Visva Bharati ,Santiniketan

(1) Introduction:

Regolith is the layer of broken and unconsolidated rock and soil material that forms the surface of the land and covers the bedrock nearly everywhere. An understanding of its properties and structure is very important in topics such as groundwater supply, soil conservation and exploration efforts for economic materials. Regolith, Soils and Landforms is a manual for students, professionals and researchers concerned with the practical examination and analysis of earth surface materials in the field. The text describes many economic aspects of regolith studies, such as the formation of mineral deposits, the importance of weathering zones and how the chemistry of regolith affects human health. Presenting a new view of the geological history of the earth, it places emphasis on the formation and destruction of regolith materials and provides a challenge for established concepts in landscape evolution. It will be an essential research to a wide range of readership including students of Geology, Geomorphology, Geography, Agriculture and Engineering as well as professionals dealing with regolith in their own work.

(2) Objectives:

Of all the material making up the solid Eaeth, the most important to humans is its surface mantle, the Regolith. Type and proportion of Regolith in an area controls the geological, geomorphological, hydrological as well as the socio-economic condition of the area. So some major objectives of this research work are-

- To find out the major causes of Regolith formation in this area.
- To know the impact of Regolith on the physical landscape of this area.
- To knowImpact of Regolith on the socio-economic condition of this area.

(3) Basis of Selection of the area:

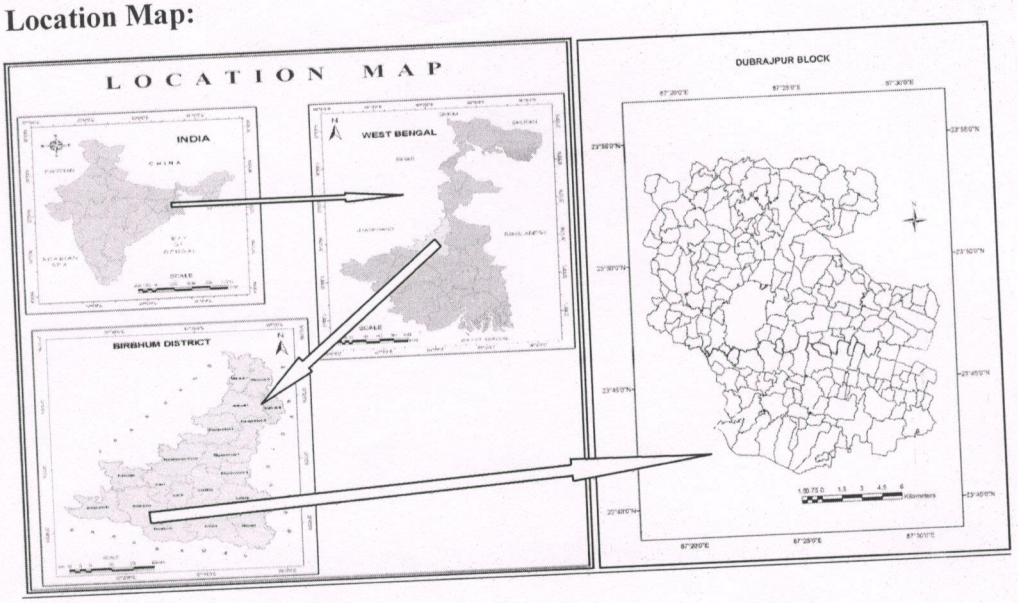
Regolith formation in Dubrajpur block is predominant. As mentioned in several literatures the area is a part of Chotanagpur plateau rim, here depth of soil, high slope and lower order seasonal streams are the primary causes for this type of phenomenon. As a resident of the area I have observed some impacts of regolith not only on the physical landscape, but also in the land use pattern of this region. Being a student of Geography I preserved interest to explore the under lying cause for its origin and its effect on the physical landscape as well as economic landscape. These are some of the inspiring besis for selecting Dubrajpur block of Birbhum district (W.B) as my study area.

(4) Study Area:

Dubrajpur Block:

Dubrajpur block is an administrative division in Suri Sadar subdivision of Birbhum district in the Indian state of West Bengal. The block has an area of **342.71 km².** Dubrajpur, Ilambazar and Sadaipur police stations serve this block. Headquarters of this block is at Dubrajpur. Gram panchayats of Dubrajpur block/panchayat samiti are: Balijuri, Chinpai, Gohaliara, Hetampur, Jashpur, Lakshinarayanpur, Loba, Paduma, Parulia and Sahapur.

Location Map:



Demography of the study area:

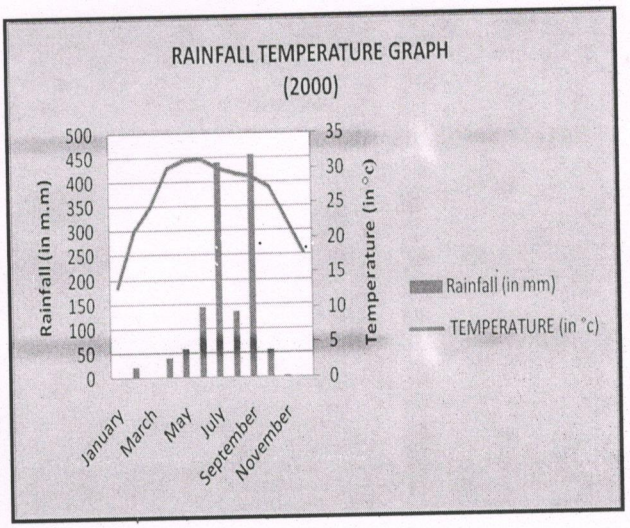
According to the Census - 2011, the total population of Dubrjpur block is 181412. There are 92937 males, 88472 females and 3 belong to other gender. The number of total literates of the area is 105949. Among the total literate people, 61227 are males, 44721 are females and 1 belongs to other gender.

Climatic condition of the study area:

The area is characterized by very hot summer and very cold winter season, during summer (April-June) temperature increase up to 45°C, on the other hand minimum temperature during winter (December-February) becomes only 5°C. Average temperature of this area is 26°C.

Year -2000

Months	Rainfall (in mm)	Temperature (in °c)
January	0	13
February	22.5	21.03
March	0	24.44
April	40.2	29.98
May	57.9	31.15
June	144.6	31.3
July	441.3	30.02
August	136.4	29.27
September	456	28.82
October	57.2	27.28
November	4.1	22.85
December	0	17.95



Soils:

The area is occupied by Alluvial soil, Red sandy soil, Red loamy soil and Laterite soil.

Rocks and minerals:

The area is characterized by different type of rocks and minerals. Laterite, Unclassified Gneisses, Alluvium etc rocks and China clay, black stone, fire clay etc minerals are most common in this area.

Relief and slope:

Relief and Slope both gradually decrease towards eastern part of the area. Western part of the area has a Relief of above 100 mts and a Slope of 10-20 mts and gradually it become 50-100 mts and less than 10 respectively towards east.

General land use and cropping pattern:

Larger part of that area is arable land but most of the land has not the irrigation facilities, among the crops Rice and Wheat are major. Urban settlements like Dubrajpur and number of rural settlements are present here.

(5) Data sources:

Primary Data:
Primary data regarding the origin of regolith will be collected through careful investigation with the aid of necessary instruments, structured questionnaire will be prepared for gathering the impact of regolith on socio economic environment.

Secondary Data:
Regarding the study area SOI Toposheet, Texus map, IRS LISS-3 satellite images, SRTM data are some necessary sources. More over soil map of NIC, Ground Water data from Central Ground Water Board, Geological map of GSI, maps of NATMO etc are some important data sources.

(6) Methodology:

To fulfill these objectives, a concrete methodology has been applied as follows.

Pre-field study:
It aims towards the collection of sporadic secondary writings before going to the field. These writings will be collected from various literature, journals, magazine, published reports, Articles, leaflets in hardcopy internet etc. This secondary information will help to pre-visualize and to create a pre-mental image about the whole aspects or this study topic.

Field study:
The primary data will be collected through an extensive field survey. Questionnaires will be prepared to survey the regolith formation in this area and its impact on physical landscape as well as in socio economical life of local people. During field survey, satellite imageries and GPS and remote sensing will be taken into account as per the availability to prepare maps.

Post-field study:
After receiving all data and related to information it will be necessary to tally the result with field observation in order to wipeout the discrepancies in the final result. Analyze is will be done on the basis of available data attain of represent results through cartographic, statistical techniques. Overall finding will be outlined and will be represented through different maps and diagrams.

(7) Hypothesis:

Hypothesis are as follows-

- Regolith formation of Dubrajpur Block is actively going on.
- Spatial differences in the nature and magnetute of Regolith formation is largely responsible for spatial differences in soil and consequent agricultural landscape.

(8) **Proposed chapters-**

Chapter I: INTRODUCTION

- *AIMS AND OBJECTIVES, SCOPE OF THE STUDY*
- *NEED FOR THE STUDY OF REGOLITH FORMATION AND ITS IMPACT*
- *HYPOTHESIS*
- *DATA BASE AND METHODOLOGY*
- *LIMITATIONS OF THE DATA AND METHODOLOGY*

Chapter II: THE STUDY AREA

- *RELIEF*
- *GEOLOGY*
- *DRAINAGE*
- *CLIMATE*
- *VEGETATION*
- *SOIL*
- *POPULATION*
- *LAND USE*

Chapter III: MORPHOMETRIC ANALYSIS OF THE STUDY AREA

- *LINEAR MORPHOMETRY*
- *AREAL MORPHOMETRY*
- *RELIEF MORPHOMETRY*

Chapter IV: GEOGRAPHIC PROCESSES AND RESULTANT FEATURES

- *ENDOGENETIC PROCESSES*
- *CLIMATIC PROCESSES*
- *CHEMICAL, MINERALOGICAL AND PHYSICAL NATURE OF THE MATERIALS FROM WHICH REGOLITH IS FORMED*
- *TOPOGRAPHIC POSITION*
- *DRAINAGE CONDITION*
- *LANDSCAPE PROCESSES INCLUDING EROSION AND DEPOSITION*
- *BIOLOGICAL ACTIVITY*

- *REGOLITH AND ITS CHARACTERISTICS*

Chapter V: IMPACT OF REGOLITH ON PHYSICAL LANDSCAPE

- *REGOLITH AND ITS EFFECT ON SOIL TYPE, TEXTURE*
- *REGOLITH FORMATION AND RUN OFF RELATION*
- *REGOLITH AND GROUND WATER*
- *REGOLITH AND RATE OF RIVER DEPOSITION*
- *REGOLITH AND EROSION HAZARD*

Chapter VI: IMPACT OF REGOLITH ON LAND USE

- *LAND USE LAND COVER OF THE STUDY AREA*
- *RELATIONSHIP OF REGOLITH FORMATION AND LANDUSE AND ASSESMENT*

Chapter VII: REGOLITH AND ITS EFFECTS ON SETTLEMENT AND TRANSPORT

Chapter VIII: SUGGESTIONS AND RECOMMENDATION

- *SUMMARY AND CONCLUSION*

(10) Practical Utility:

From this research Researchers will able to get knowledge about causes of regolith formation in this area, they will also able to understand that why the process of formation of regolith is predominant in this area, and how it impact on physical as well as socio-economic scenario of this area. It will help planners to make soil map and land use map of this area. Common people will be able to use their own land on proper way in case of agricultural activities, making of settlements and making of transport routs.

REFERENCES:

- *Degraded lateritic soils cape and land uses in Birbhum district, West Bengal, India. V. C. Jha, S. Kapat*
- *Rill and Gully erosion risk of lateritic terrain in south western Birbhum District, West Bengal, India. V.C. Jha, S. Kapat.*
- *Laterite and landscape development in tropical lands- a case study. V.C. Jha*
- *Regolith Geology and Geomorphology. G. Taylor, R.A Eggleton.*
- *Hydrology of soils and deep regolith: A nexus between soil geography, ecosystems and land management. Philip J. Schoeneberger, Douglas A. Wysocki*

Somnath Saskar
22/07/2018

अध्यापक / Professor
भूगोल विभाग / Department of Geography
विश्वभारती / Visva-Bharati
शान्तिनिकेतन ७३१२३५ / Santiniketan-731235